ISSN 0511-5728
The West Indian Journal of Engineering
Vol.38, No.1, July 2015, pp.96-107

Influence of Submicron Agro Waste Silica Particles and Vinyl Acetate on Mechanical Properties of High Density Polyethylene Matrix Composites

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(Received 9 April 2015; Revised 16 June 2015; Accepted 29 June 2015)

Abstract: *Development of polymeric composites has invoked much interest in recent years. These fillers have great effect on the mechanical properties of polymers. The present study developed two groups of High Density Polyethylene (HDPE) matrix composites reinforced with silica particles extracted from rice husk ash (RHA) and Vinyl Acetate. The silica powder particles with average particle size of 0.489 μm were produced by Sol-gel process. HDPE based composites were prepared by melt compounding with 2, 4, 6, 8 and 10 wt. % of silica particles and 30 wt. % Vinyl Acetate with a Rapra single screw extruder and were produced by compression moulding. Mechanical behaviour and microstructure of the developed composites were studied. It was observed that the mechanical properties increased with an optimum value of 4wt. % of silica particles in HDPE. There was improvement in the mechanical properties of the siliceous HDPE composites when compared with Ethylene Vinyl Acetate (EVA) composites.*

Keywords: *Density Polyethylene, Ethylene Vinyl Acetate, Mechanical properties, Rice husk ash, Sol-gel process*